

*United States Army*  
*Logistics Integration Agency*



**Army Power and Energy Strategy**

**Briefing  
To**

**Army World Wide Environmental and  
Energy Conference**

**6 Dec 00**





# Army Energy Program



**Conserve with Comfort and Common Sense**



# Army Alternative Fueled Vehicles

## PURPOSE

- This session will focus on the Army's strategy on tactical mobility energy.
  - Fuel constitutes 70% of logistical burden.
  - Lighter more efficient vehicles are more maneuverable and offers several tactical advantages.





# Army Alternative Fueled Vehicles

## ■ FY 2000 - CONUS

- |                        |               |        |
|------------------------|---------------|--------|
| – GSA Leased NTV       | 49,000        |        |
| – Light Duty Vehicles  | 35,799        |        |
| – Annual Turnover      | 8,000         |        |
| – Turnover within MSA  | 4,000         |        |
| – EPACT Target         | 4,000         |        |
| – Army EPACT Goal      | 3,000         | or 75% |
| – AFV Currently Leased | 1,840         | or 46% |
| • 1447                 | E85           |        |
| • 395                  | CNG Dual Fuel |        |
| • 8                    | Dedicated CNG |        |

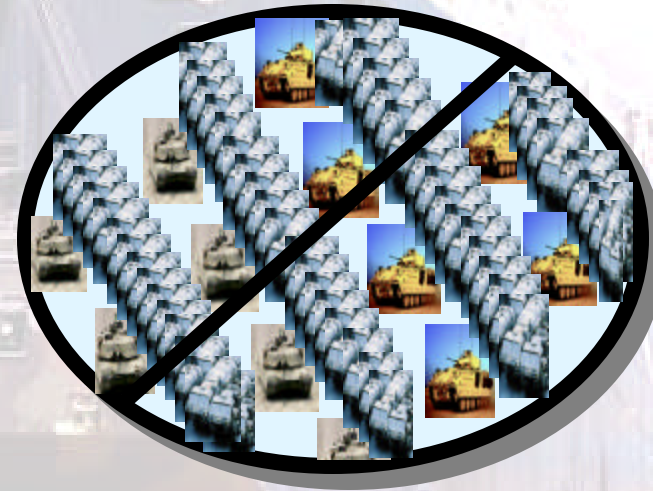
## ■ Starting this Year - Fund AFV's through a \$5.00 Surcharge



# Logistics Transformation Enablers

## Tactical Vehicles - Transformation Enablers

- Emerging Technologies
- Potential to dramatically increase fuel efficiency
- Increase vehicle range
- Potential to eliminate need to tow large generators
- Power on-board electrical systems
- Potential acoustic stealth
- Reduces emissions





# Logistics Transformation Enablers

## ■ Advanced Lift

- Advanced Tactical Transport
- Future Transport Rotorcraft
- Theater Support Vessel
- Shallow-Draft High Speed Ship



## ■ Laundry Advanced System

## ■ Weapon System Support, Platform-Based

- Diagnostics and Prognostics (Built-In) Plans are to monitor fuel expenditures on the platform.



## ■ Advanced Light Armament for Combat Vehicles

- Lighter weight contributes to less fuel consumed.



# Logistics Transformation Enablers

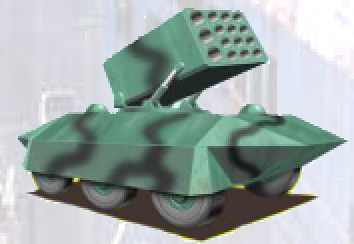
- **Electric Rotorcraft**
  - Provides advanced electromechanical/electrical power generating devices to replace hydraulic/mechanical drive systems
- **Future Combat Systems**
  - Reduces up to 90% logistics/sustainment demands.
  - Plan to use other than diesel or turbine engine ... either electric or hybrid electric.
- **Petroleum, Oil & Lubricants Quality Analyzer Sensors**
  - Develops and demonstrates device(s) to diagnose mechanical problems & extend oil and lubricant life.
- **Variable Geometry Advanced Rotor Technology**
  - Increases range 91% or payload 66%; increases reliability 20%; reduces O&S costs 21%





# Logistics Transformation Enablers

- **Alternative Propulsion Sources**
  - Potential technologies for low-observable air vehicles
- **Ballistic Protection for Future Combat Systems**
  - Reduces weight
- **Combat Hybrid Power Systems**
  - Hybrid electric vehicle architecture for future vehicles
- **Combat Vehicle Concept and Analysis**
  - This enabler will produce the Army's next generation of combat and combat support vehicles. Goal is to develop new vehicles which are 33 %lighter.





# Logistics Transformation Enablers

- **Ground Propulsion and Mobility**
  - Provides critical engine electronic drive, track & suspension & storage devices.
- **High-Energy, Cost-Effective Batteries**
  - Batteries with energy content 20% greater than that of the existing nickel-metal hydride battery.
- **Integrated High-Performance Turbine Engine Technology**
  - Reduces fuel consumption by up to 25% and increases power-to weight ratio by 60%
- **Integrated Power Generation and Management**
  - Tools and Strategies for Reduced Power Consumption
- **Lightweight Soldier**
  - Reduces power requirements and logistics demand.





# Logistics Transformation Enablers

- **Low-Power Display Components**
  - Reduces number of batteries that must be maintained for each unit.
- **Nanocomposites and Nanofibers For Warrior Systems**
  - Provides the Land Warrior lightweight power generating devices from new conducting polymers.
- **Power Conversion Technology for FCS**
  - Reduces logistics demand through improved electric, drive, track & suspension technologies.
- **Reforming Diesel (Cogeneration for Field Services)**
  - Reduces dependency on field generators.





# Logistics Transformation Enablers

## ■ Water Purification Technology

- Innovative individual or small hand held water purifier.
- Portable water production system.



## ■ Concepts for 21<sup>st</sup> Century Truck-Based Tactical Vehicles

- Enables virtual prototyping design explorations of vehicles.

## ■ Real-time Collaborative Engineering

- Using advanced visualization capabilities to make informed development, evaluation, integration and trade-off decisions.

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# Background

## May 1999 Power & Energy Seminar

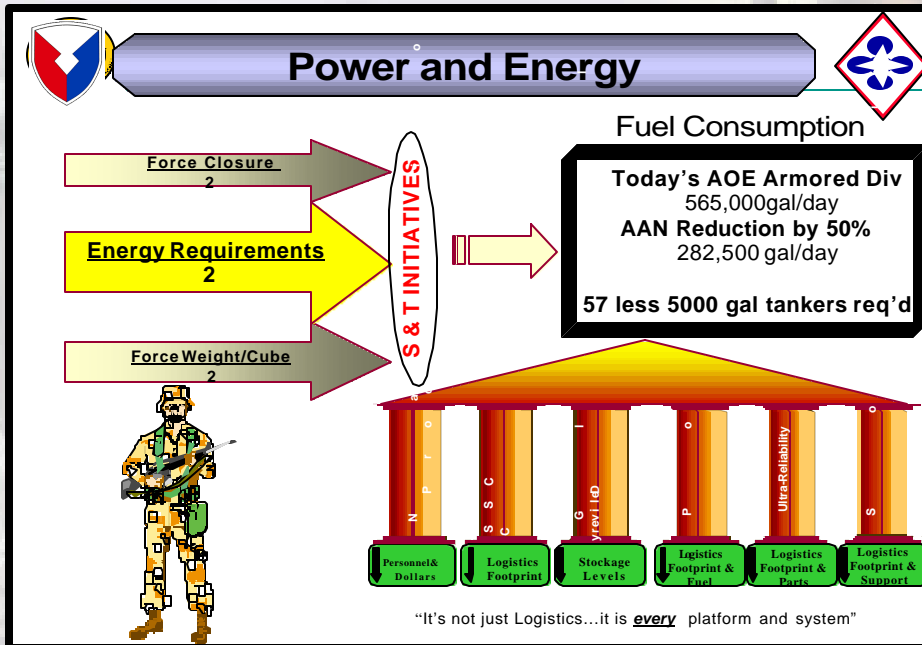
GOAL: Reduce the Requirement to Distribute Power & Energy on the Battlefield



### Seminar Recommendations



- Direct Formation of Task Force (composed of logistics, acquisition and S&T community)
- Develop Army Power and Energy Strategy
  - Recommend appropriate departmental management structure
  - Recommend appropriate investment strategy
  - Establish baseline metrics and stretch goals

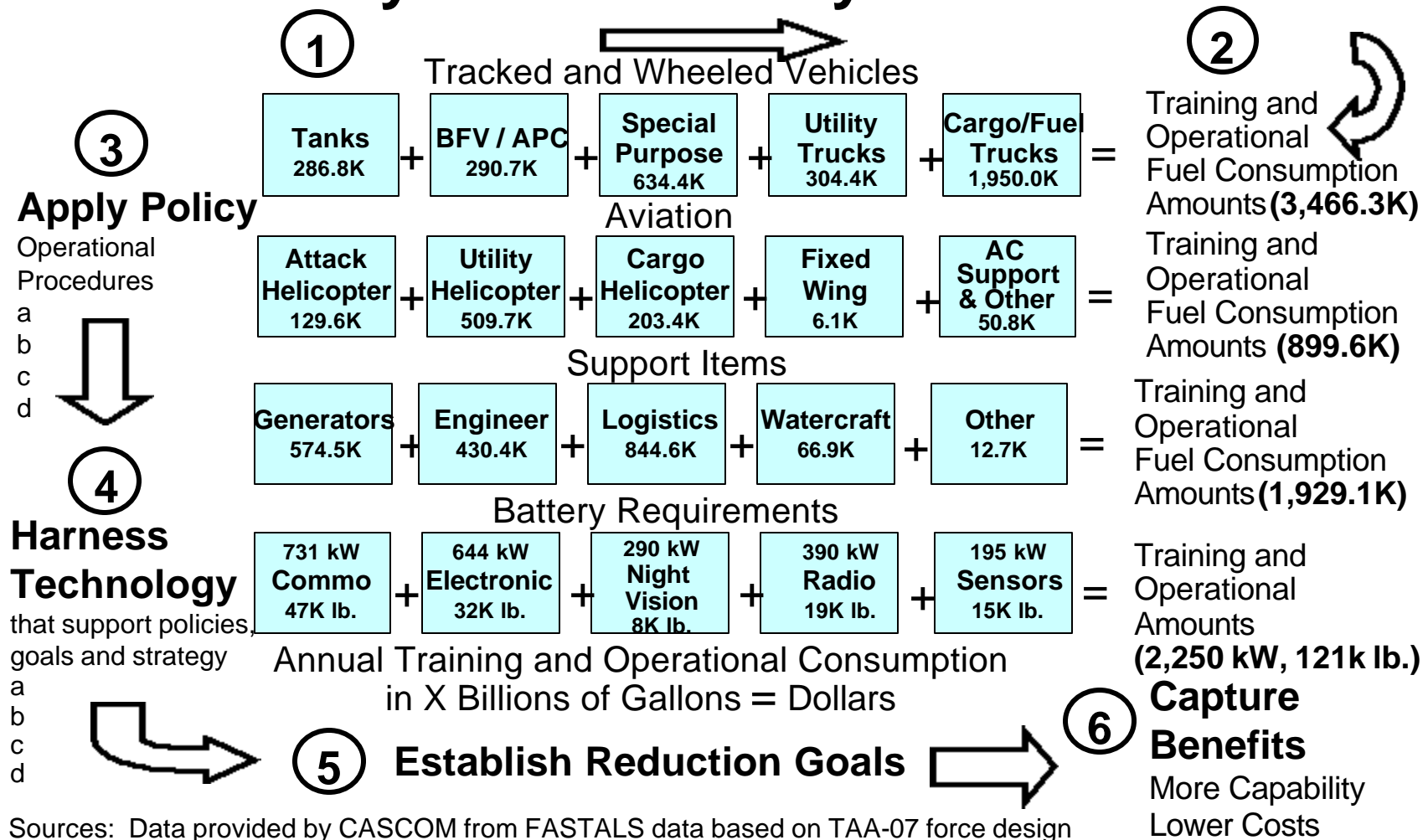


**The Task:**  
Current Policies  
Goals & Metrics  
Baselines  
Investment Strategies  
Strategy Execution



# What We Found

## Army Battlefield Day Baseline





# Opportunities

M1 Abrams Tank  
 AH-64 Apache  
 UH-60 Blackhawk  
 CH-47 Chinook  
 AVLB  
 M 9 ACE  
 M 88 Recovery Veh  
 M2/M3 Bradley  
 MLRS  
 Patriot  
 M113 Family  
 HEMTT  
 SEE  
 M915 Tractor  
 AN/TPQ-36/37  
 Shop Shelters  
 FAASV  
 D7G  
 SUSV  
 621B Scraper  
 HMMWV  
 Power Systems  
 Soldier

2002	Engine/Transmission	2006	Future Combat System	2012	Upgrades
2002	Engine/Transmission	2006	Commanche	2012	Upgrades
2002	Engine/Transmission	2006	UH-60 Model X	2012	Upgrades
2002	Engine/Transmission	2006	CH-47 Model X/UltraHeavy Lifter	2012	Upgrades
2002	Engine/Transmission	2006	Successor Vehicle	2012	Upgrades
2002	Engine/Transmission	2006	Successor Vehicle	2012	Upgrades
2002	Engine/Transmission	2006	New FCS Recovery Veh	2012	Upgrades
2002	Engine/Transmission	2006	FCS	2012	Upgrades
2002	Engine/Transmission	2006	Crusader	2012	Upgrades
2002	Engine/Transmission	2006	Crusader	2012	Upgrades
2002	Engine/Transmission	2006	FCS	2012	Upgrades
2002	Engine/Transmission	2006	21st Century Truck	2012	Upgrades
2002	Engine/Transmission	2006		2012	Upgrades
2002	Engine/Transmission	2006	21st Century Truck	2012	Upgrades
2002	Amp/Converter/Elec Comp/Pwr Sup	2006		2012	Upgrades
2002	Amp/Interc box/Pwr Sup/Trans Assy	2006	Next Generation	2012	Upgrades
2003	Eng/Trans/Gen Eng/Starter Elec	2007		2012	Upgrades
2003	Engine/Transmission/Generator	2007		2012	Upgrades
2003	Eng/Trans/Starter/Gen/Radiator	2007		2012	Upgrades
2003	Engine/Transmission/Heater	2007		2012	Upgrades
2003	Engine/Trans/Generator Engine	2007	Rebuy with Hybrid-Electric Engine	2013	Upgrades
		2006	Adv Med-size Mobile Power Sys	2012	Upgrades
2002	Improved Batteries/Power Mgt	2006	Land Warrior Upgrades	2012	Upgrades

Energy Efficiency Insertion points

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# What this Strategy Does for the Army ...

- Establishes corporate statements of goals and policy for Tactical Power and Energy
- Establishes framework for Power and Energy Oversight
  - AEEPB becomes the POM advocate for Power and Energy; work with the ASA (ALT)
- Provides the means to measure improvements
- Recommends activities to better synchronize S&T investments, acquisition, sustainment, and disposal based upon Power and Energy implications.



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*The Director of LIA, Mr. Mark J. O'Konski, welcomes you to the Agency of FUTURE ARMY LOGISTICS Evaluating and Planning for the 21st Century.*

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